REMARKS

Reconsideration of the application is requested. This preliminary amendment is being filed simultaneously with an RCE.

As of the mailing of the current Office Action, claims 9-22 were pending in the subject application.

Applicant has amended claim 9 herein. Applicant represents and asserts that no new matter is added by any amendments herein.

I. REJECTIONS UNDER 35 USC 112

Claims 9-22 have been rejected on pages 3-4, items 7-9, under 35 USC 112, second paragraph.

Applicant respectfully traverses this rejection.

For the methanization reaction of the present invention, the ratio of H2/CO is important to provide the correct relationship of reactants for the water gas shift and methanization reaction happening in the reactor at the same time. Claim 9 is amended herein to recite the term "mole ratio." Applicant asserts that the amended claim is supported in the specification and support is found, at least, in the published application (U.S. Pat. App Pub. No. 2007/0299288) at para. [0036].

Applicant respectfully requests reconsideration and withdrawal of this rejection.

II. CLAIM OBJECTION

Claims 9-22 have been objected to as set forth on page 4, item 10 of the current Office Action. Applicant has corrected the misspelling and respectfully requests reconsideration and withdrawal of this objection.

III. REJECTION UNDER 35 USC 103(a)

A. OWNERSHIP

Item 13 sets forth the obligation to point out aspects of the invention not commonly owned.

The current application is commonly owned and an assignment was executed by the inventors on September 15, 2006 and recorded in the USPTO assignment division on June 7, 2007 and Reel/Frame 019439/0045.

B. REJECTION OVER CITED REFERENCES

Claims 9-20 and 23-28 have been rejected in the current Office Action, on pages 4-7, items 14-16, as being unpatentable over the Child and Broecker references of record.

Applicant respectfully traverses this rejection.

Applicant acknowledges that the current rejection is based on a combination of references into a single instructive disclosure. Applicant will detail the deficiencies of each reference and then demonstrate the deficiencies in the combined disclosure.

The Child reference discloses a methanization process where the raw gas is originating from coal or coke under very specific conditions with respect to the removal of carbon monoxide. However, Child is deficient because the raw gas generated from coal contains a significant amount of sulphur components but does not contain higher hydrocarbons and aromatic hydrocarbon as required in the feed gas mixture given present claim 1.

Broecker discloses a process for the generation of methane using feedstocks as disclosed in column 4, lines 29 to 36, and in column 11, lines 60 to 66. These feedstocks are specific for the steam reforming process and rich gas process.

The feedstock of Broecker for steam cracking of hydrocarbons requires 100% of mixtures of hydrocarbons of average C number from C1 to C30, predominantly paraffinic hydrocarbons, but also aromatic hydrocarbons and naphthenic hydrocarbons.

Therefore, the feedstock of Broecker is completely different from the feedstock used in our invention according to the amended claim 1. The rich gases for the

methanization of Broecker, disclosed in column 4, lines 41 to 54, from low temperature cracking of naphtha in general already contain, after drying, 50 to 75% methane, 19 to 25% of carbon dioxide, up to 16% of hydrogen and up to 5% of carbon monoxide. Broecker further discloses that these gases now can pass over a nickel catalyst, using preheating temperatures from 200 to 300°C, without causing coking of the catalyst.

At that stage, the feed gas of Broecker which is passed to the methanization catalyst is completely free of C2 components and aromatic hydrocarbons which is in contradiction to the composition of the feed gas according to the present invention.

In particular, the coking of the catalyst of Broecker is by passing C2 components and aromatic hydrocarbons over the methanization catalyst. Therefore, Broecker has a two-stage process: Starting with the cracking of a feedstock that may comprise C2 components and aromatic hydrocarbons to receive a feed gas for the subsequent methanization process that is completely free of any C2 components and aromatic hydrocarbons and then the methanization step with this feed gas being completely free of C2 components and aromatic hydrocarbons (see for example column 9, lines 43 to 46, column 10, lines 24 to 26, lines 47 to 51). At these references, the feedstock for the methanization is completely free of C2 components.

This is contrary to the subject invention. In the subject invention, C2 and aromatic hydrocarbons must be present in the composition of the feed gas used in the methanization step.

The reaction efficiency of the present invention is superior of any level that can be reached by a retrospective combination of Child et al. and Broecker. Broecker requires additional energy since the cracking of the C2 components and aromatic hydrocarbons is an endothermic reaction that requires the supply of external heating.

Broecker also needs to account for the additional energy gain which is achieved due to the exothermic methanization reaction in the second stage. Due to the known risk of the coking of the catalyst in presence of the C2 components and aromatic components during methanization, the person skilled in the art would never come to the conclusion to go for the risk of combining the cracking reaction and the methanization reaction within the same catalyst bed/reactor.

To the contrary and in particular for thermal reasons, the present invention can only work properly when a feasible amount of C2 components and aromatic hydrocarbons is present in the feedstock for the methanization reaction.

Applicant refers to the table included on page 3 of the Rule 132 declaration of Dr. Biollaz submitted on October 2, 2010, where in the phases II and III about approximately 15 g/Nm3 BTN (Benzene, Toluene, Naphtalene) and higher tars are present. As compared to the amount present in phase I, the content of aromatic

hydrocarbons and higher tars is roughly about 50-times higher than during phase I. This feasible amount of BTN's and higher tars therefore absorbs the excess heat stemming from the exothermic methanization reaction in order to establish the endothermal cracking reaction thereby avoiding the coking of the catalyst bed. Therefore, both reaction types are required in order to optimize the energy balance of the overall process and to avoid a wear of the catalyst bed due to coking effects.

The Office Action alleges that the present claim would also read minor amounts of C2 components and aromatic hydrocarbons including the ppb range. We traverse this argument with the fact that the gas compositions of Broecker which go into the methanization reaction are absolutely free of C2 components and aromatic hydrocarbons because these components are removed entirely in the first cracking step. Further, Broecker never discloses the desire to provide C2 components and aromatic components into the methanization reaction when explicitly disclosing the mandatory use of a first cracking step prior to the second methanization step.

When one combines the teachings of Child and Broecker into a single instructive disclosure, the combined deficiencies remain and there is no teaching or suggestion for the claimed invention requiring, inter alia, feed gas mixture including carbon monoxide, hydrogen, water vapor, C_2 components and aromatic hydrocarbons. Because of the failure of the cited references to teach or suggest the claimed invention, Applicant respectfully asserts a rejection under 35 USC 103(a) cannot be properly maintained. Applicant respectfully requests reconsideration and withdrawal of this rejection.

C. REJECTION OF CLAIM 21

The current Office Action, on page 7, items 17-18, has rejected claim 21 over the Child '000 and Broecker references discussed above and further in view of Child '113.

Applicant respectfully traverses this rejection.

As discussed above, Child '000 and Broecker references are deficient in their teaching. Claim 21 is dependent on independent claim 9. Combination of Child '000 and Broecker references with child '113 fails to cure the deficiency.

The recitation of benzene and toluene, as cited in the Office Action does not provide the teaching or suggestion for independent claim 9 requiring, inter alia, feed gas mixture including carbon monoxide, hydrogen, water vapor, C_2 components and aromatic hydrocarbons.

Thus, Applicant respectfully asserts that the combined disclosure of Child '000, Broecker, and Child '113 remains deficient for failing to teach or suggest the claimed invention. Because of the failure of the cited references to teach or suggest the claimed invention, Applicant respectfully asserts a rejection under 35 USC 103(a) cannot be properly maintained. Applicant respectfully requests reconsideration and withdrawal of this rejection.

In view of the foregoing, reconsideration and allowance of claims 9-22 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of three (3) months pursuant to Section 1.136(a) in the amount of $1,110.00 in accordance with Section 1.17 is enclosed herewith. Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to Deposit Account Number 12-1099 of Lerner Greenberg Stemer LLP.

Respectfully submitted,

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March 21, 2011

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